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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/292,862	04/16/99	WALTER M	07540/020003

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KRISTINA BIEKER-BRADY PH D
CLARK & EBING LLP
176 FEDERAL STREET
BOSTON MA 02110

EXAMINER	
TURNER, S	

ART UNIT	PAPER NUMBER
1647	15

DATE MAILED: 06/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/292,862	Walter et al
Examiner	**Art Unit**
Sharon L. Turner, Ph.D.	1647

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 12-27-00

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-17 is/are pending in the applica

4a) Of the above, claim(s) 6-7, 9-10, 12-14 and 15-17 to the extent of claim 7 is/are withdrawn from considera

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-5, 8, 11, and 15-17 to the extent of claim 1 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☒ Claims 1-17 are subject to restriction and/or election requirem

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 7, 8

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

DETAILED ACTION

Election/Restriction

1. Claims 1-17 are pending. Applicants election of Group I, claims 1-5, 8, 11 and 15-17 without traverse in Paper No. 11 is acknowledged

2. Claims 6-7, 9-10, 12-14 and 15-17 to the extent of claim 7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 11.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-5, 8, 11 and 15-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

The specification discloses SEQ ID NO's: 1 and 2 which correspond respectively to the nucleotide sequence and the amino acid sequence of the human FREAC3 gene. These SEQ ID NO's meet the written description provisions of 35 USC 112, first paragraph. However, the claims are directed to and encompass genes, corresponding sequences from other species,

mutated sequences, allelic variants, and splice variants. None of these sequences meets the written description provision of 35 USC 112, first paragraph. In particular it is noted that as recognized by Lewin Ed., Genes IV, Oxford University Press 1990, p. 810, a gene encompasses that segment of DNA involved in producing polypeptide chains including regions preceding and following the coding region (leader and trailer) as well as intervening sequences (introns) between coding regions (exons). Although SEQ ID NO:1 contains some sequences upstream and downstream such sequences are not recognized or disclosed as the full leading and trailing sequences which are responsible for the regulated gene expression of the polypeptide via mRNA within the natural host, i.e., the full promoter and trailer sequences of the DNA from which the mRNA is transcribed.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that, "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is for purposes of the 'written description' inquiry, whatever is now claimed." (See Vas-Cath at page 1116.)

With the exception of SEQ ID NO's:1 and 2 of the instant application, the skilled artisan cannot envision the detailed chemical structure of the encompassed nucleic and amino acid sequences and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. The specific nucleic and amino acids are required. See Fiers v.

Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016.

One cannot describe what one has not conceived. See Fiddes v. Baird, 30 USPQ2d 1481, 1483. In Fiddes v. Baird, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class. The specification provided only the bovine sequence.

Therefore, only SEQ ID NO's:1 and 2 , but not the full breadth of claims meet the written description provision of 35 USC 112, first paragraph. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. (See page 1115.)

5. Claims 1-5, 8, 11 and 15-17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the sequences of SEQ ID NO:1 and 2 which describe a FREAC3 gene product, does not reasonably provide enablement for a method of diagnosing a mammal for an increased likelihood of having a developmental defect or developing a disease of the eye by analyzing nucleic acid of said mammal to determine whether said nucleic acid contains a mutation in a FREAC3 gene wherein the presence of said mutation is an indication of increased likelihood of developing a disease of the eye. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specifications disclosure is insufficient to enable one skilled in the art to practice the invention as broadly claimed without undue experimentation. The factors relevant to this discussion include the quantity of experimentation necessary, the lack of working examples, the unpredictability of the art, the lack of sufficient guidance in the specification and the breadth of the claims.

Applicants claims are directed to the generic recitation of analyzing nucleic acid from a mammal. The skilled artisan recognizes a multitude of experimental techniques sufficient to analyze nucleic acid sequences including for example hybridization, Polymerase Chain Reaction (PCR), Restriction Fragment Length Polymorphism analysis (RFLP), nucleic and amino acid sequencing, homologous recombination, expression studies, in situ Hybridization and Reverse Transcriptase-PCR. However, the skilled artisan also recognizes that the success of such methodologies is unpredictably dependent upon variables such as the nucleic acids employed in the techniques, hybridization conditions, the relatedness of gene sequences, species variation and the inability to predict structural and functional determinants of nucleic and amino acid sequences, see in particular Skolnick et al., Trends in Biotech, 18(1):34-39, 2000 and Sambrook et al., Molecular Cloning, Cold Spring Harbor Laboratory Press, 1989, p9.47-9.51 and 11.48-11.49.

With respect to applicants claims, the skilled artisan is not apprised of that which is identified as a FREAC3 gene because the relevant nucleic and amino acids are absent from the claims. There is no guidance as to what methodologies should be employed to analyze the

nucleic acids and there is no defined sequences which are identified as either FREAC3, mutated FREAC3 which indicates a developmental defect or disease of the eye, or disclosure of sequences which may be used to analyze for the presence or absence of FREAC3 and FREAC3 mutations. Thus, the skilled artisan would be forced into further undue experimentation to discover the FREAC3 gene sequences, gene products and methodologies sufficient to identify normal and mutated sequences. Further, the skilled artisan would be required to determine which mutations led to either developmental defects or eye disease.

Thus, in view of the quantity of experimentation necessary, the lack of working examples, the unpredictability of the art, the lack of sufficient guidance in the specification and the breadth of the claims, it would take undue experimentation to make and use the claimed invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5, 8, 11 and 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitations of a FREAC3 gene and mutations in a FREAC3 gene are indefinite terms to the skilled artisan as the claims do not structurally define the products such that the skilled artisan can recognize, test for, make or use the desired sequences. In the absence of a structural definition of FREAC3 or a FREAC3 mutation any genetic nucleic acid would meet the limitations of the claims.

Claim Rejections - 35 USC § 102 or 103

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 8, 11, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Mears et al., Am. J. Hum. Genet., 59:1321-27, 1996.

Mears et al., teach autosomal dominant genetic mutations which cause anterior segment dysgenesis. The mutation maps to chromosomal location 6p25. The disease marks with 6p deletions in humans and results in juvenile glaucoma, see in particular Abstract and Linkage Analysis, p. 1321-22. Although the reference fails to disclose a FREAC3 gene or mutation the nucleic acids analyzed at 6p25 meet the limitations of a genetic nucleic acid sequence which may be recognized or named such by the skilled artisan absent factual evidence to the contrary or defining structural limitations of FREAC3. Thus, the reference teachings anticipate the claimed invention.

10. Claims 1, 8, 11, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Mirzayans et al., Am. J. Hum. Genet., 61:111-19, 1997.

Mirzayans et al., teach genomic-mismatch scanning using PCR amplified DNA which identifies the human chromosomal region 6p25 containing the locus for anterior segment

dysgenesis or Iridogoniodysgenesis which results in juvenile glaucoma, see in particular Abstract and Chromosome 6 Marker Results with GMS. Although the reference fails to disclose a FREAC3 gene or mutation the nucleic acids analyzed at 6p25 meet the limitations of a genetic nucleic acid sequence which may be recognized or named such by the skilled artisan absent factual evidence to the contrary or defining structural limitations of FREAC3. Thus, the reference teachings anticipate the claimed invention.

Status of Claims

11. No claims are allowed.

12. Any inquiry of a general nature or relating to the status of this general application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Papers relating to this application may be submitted to Technology Center 1600, Group 1640 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). Should applicant wish to FAX a response, the current FAX number for Group 1600 is (703) 308-4242.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharon L. Turner, Ph.D. whose telephone number is (703) 308-0056. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 6:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz, can be reached at (703) 308-4623.

Sharon L. Turner, Ph.D.
June 25, 2001

CHRISTINE J. SAOUD
PRIMARY EXAMINER
Christine J. Saoud